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| 09/749,354 | 12/27/2000 | Stuart I. Hodge JR. | 786-009917-US (PAR) | 5467 |

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PERMAN & GREEN
425 POST ROAD
FAIRFIELD, CT 06430

EXAMINER

LAXTON, GARY L

| ART UNIT | PAPER NUMBER |
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2838

DATE MAILED: 11/29/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/749,354

Applicant(s)

HODGE, STUART I.

Examiner

Gary L. Laxton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 6) ☐ Other: ____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **pre-regulator** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. ✓

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **power amplifier** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. ✓

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2, 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2:

- Claim 2 recites "pre-regulator" in line 2. Applicant's intentions are unclear. Furthermore, the specification is silent concerning the "pre-regulator" or any pre-regulation.

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Claim 11:

- Claim 11 recites "enabling at least on IC associated with..."; this is vague and indefinite.
- Claim 11 recites the limitation "IC" in line 6. There is insufficient antecedent basis for this limitation in the claim.
- Claim 11 recites the limitation "IC power capacitor" in line 7. There is insufficient antecedent basis for this limitation in the claim.

NOTE: elements in parenthesis are ignored.

Claims 12 and 13:

Claim 12 in it's entirety is vague and indefinite. Claims 13 inherits the vagueness of claim 12. Furthermore, claim 13 is structured in a vague and indefinite way.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 2, 4, 7, 8, 15, 16, 18, 19, 21 and 22 are rejected under 35

U.S.C. 102(b) as being anticipated by Bernstein et al.

Bernstein et al disclose a circuit for limiting inrush current in a DC power supply is disclosed. The inrush limiting circuit should be placed between an input AC power line and a power supply input capacitor bank. A thermistor is located between the capacitor bank and the input diode bridge to limit the initial inrush current. Once the input capacitor bank is fully charged, an insulated-gate bipolar transistor or IGBT switches the rectified line voltage to a boost power factor correction converter circuit, which utilizes an inductor and diode along with a field effect transistor to boost the input to a high DC

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voltage. This high DC voltage blocks the thermistor through use of a diode and keeps it cold to maintain high resistance in case of a new off/on cycle.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al.

Claim 3:

Bernstein et al discloses the claimed invention as stated above in regards to claim 1 except for the controller comprises an integrated circuit. Integrated controllers have been known in the art for many years for their desirable contributions to the advancement of the complex circuits of today. The advantages of integrated controllers are numerous. One of the many desirable features of integrated controllers is of course the size parameter. Compact size being highly desirable renders the utilization of integrated controllers obvious. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize an integrated controller in order to reduce overall circuit size.

Claim 17:

Bernstein et al discloses the claimed invention as stated above in regards to claim 15 except for the controller comprises an integrated circuit. Integrated controllers have been known in the art for many years for their desirable contributions to the advancement of the complex circuits of today. The advantages of integrated controllers are numerous. One of the many desirable features of integrated controllers is of course the size parameter. Compact size being highly desirable renders the utilization of integrated controllers obvious. Therefore, it would have been obvious to one having ordinary skill in the art

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at the time the invention was made to utilize an integrated controller in order to reduce overall circuit size.

9. Claims 5, 6, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernstein et al in combination with Inn et al.

Bernstein et al discloses the claimed invention as stated above in regards to claims 1 and 15 except for the driver comprising a charge pump or amplifier.

Inn et al teaches of a charge pump which is part of a driver circuit for an inrush current limiting circuit. The circuit includes a feedback loop including an error amplifier 50 controls the charge pump 18 to provide a gate voltage to pass transistor 12 necessary to maintain the output at a predetermined regulated voltage. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a charge pump and amplifier in a driver circuit as taught by Inn et al for assisting in driving and controlling a transistor, obviously.

10. Claims 9, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson.

Nelson discloses a direct current (DC) powered process instrument start up circuit includes an energy storage device, a switching regulator circuit, a variable impedance circuit, and a voltage measurement circuit. The energy storage device is coupled between first and second power supply terminals. The switching regulator circuit is coupled to the energy storage device and has a regulated voltage output. The variable impedance circuit is coupled between the energy storage device and the first power supply terminal and has an impedance control input. The voltage measurement circuit has a measurement input coupled to the energy storage device and a measurement output coupled to the impedance control input.

Voltage measurement circuit 56 includes resistors R12-R16 and comparator 90. The non-inverting input of comparator 90 is coupled to voltage measurement input 74 through a voltage divider formed by resistors R13 and R14. The inverting input of comparator 90 is coupled to power supply terminal 66A through a

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voltage divider formed by resistors R15 and R16. The output of comparator 90 is coupled to voltage measurement output 76. Comparator 90 has power supply inputs which are coupled to voltage output terminal 84 and ground terminal GND, respectively. Comparator 90 can include an LM193 series low power, low offset voltage comparator available from National Semiconductor Corporation, for example. Other comparator circuits can also be used.

Comparator 90 compares the voltage across energy storage circuit 52 to the voltage across supply terminals 66A and 66B. The voltage on output 76 indicates whether the voltage across energy storage circuit 52 is within a predetermined percentage of the voltage across power supply terminals 66A and 66B. The selected percentage is determined by selecting the resistance ratio of resistors R13 and R14 relative to the resistance ratio of resistors R15 and R16.

At start up, the voltage applied to the non-inverting input of comparator 90 will be less than the voltage applied to the inverting input of comparator 90, causing output 76 to be low. With output 76 low, transistor Q5 is off and allows the gate of transistor Q4 to float high, turning off transistor Q4. With transistor Q4 off, energy storage circuit 52 charges through resistor R10. Since resistor R10 has a relatively high impedance, this limits the inrush current required to charge energy storage circuit 52 and the other components within start up circuit 80. Once energy storage circuit 52 charges to the predetermined level, the voltage applied to the non-inverting input of comparator 90 reaches the voltage applied to the inverting input, and the voltage on output 76 goes high. Transistor Q5 turns on, pulling the gate of transistor Q4 low. Transistor Q4 turns on, effectively shorting resistor R10, between diode D1 and energy storage circuit 52. Thereafter, energy storage circuit 52 charges through the low impedance path formed by transistor Q4.

However, Nelson et al do not disclose using the passive device for a predetermined amount of time.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a predetermined delay time before switching to active control of the inrush current in order to prevent too long of passive control or to ensure that passive control is at least provided for a specific amount of cycles.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a predetermined delay time before switching to active control of

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inrush current in order to ensure a specific amount of cycles has elapsed before utilizing active control in order to protect the active device from overcurrent conditions.

11. Claims 10 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson in combination with Bernstein et al.

Nelson disclose the claimed invention as stated above in regards to claim 9 except for the resistance having positive temperature coefficient and the active device being an IGBT.

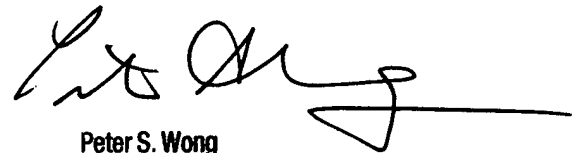
Bernstein et al teach using a circuit for limiting inrush current in a DC power supply is disclosed. The inrush limiting circuit should be placed between an input AC power line and a power supply input capacitor bank. A thermistor is located between the capacitor bank and the input diode bridge to limit the initial inrush current. Once the input capacitor bank is fully charged, an insulated-gate bipolar transistor or IGBT switches the rectified line voltage to a boost power factor correction converter circuit, which utilizes an inductor and diode along with a field effect transistor to boost the input to a high DC voltage. This high DC voltage blocks the thermistor through use of a diode and keeps it cold to maintain high resistance in case of a new off/on cycle. And, as is well known, thermistors have positive coefficients.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a passive device with a positive temperature coefficient and utilizing an IGBT as an active device as taught by Bernstein et al in order to protect a circuit from an inrush current as further taught by Bernstein et al.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary L. Laxton whose telephone number is (703) 305-7039. The examiner can normally be reached on 5-4-9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter S. Wong can be reached on (703) 305-3477. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7723 for regular communications and (703) 305-7723 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Peter S. Wong
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